

REMARKS

Claims 38, 42-43, 46-48, 50 and 52 are amended. Claim 55 is cancelled. New claims 56-59 are added. Claims 38, 42-43, 46-53 and 56-59 are pending in the application.

Applicant acknowledges the Examiner's indication of finality of the restriction requirement. Without admission as to the propriety of the Examiner's statements regarding the restriction, claim 55 is cancelled in order to narrow the issues in the event of an appeal.

Claims 38, 42, 46, 47 and 51-52 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Matsuda, U.S. Patent No. 6,143,597 as combined with Roh, U.S. Patent No. 5,783,253. In accordance with MPEP § 2143, a proper obviousness rejection has the following three requirements: 1) there must be some suggestion or motivation to modify or combine reference teachings; 2) there must be a reasonable expectation of success; and 3) the combined references must teach or suggest all of the claim limitations. Claims 38, 42, 46, 47 and 51-52 are allowable over the combination of Matsuda and Roh for at least the reason that the references, individually or as combined, fail to disclose or suggest each and every element in any of those claims.

As amended, independent claim 38 recites a capacitor having a pair of electrodes with a dielectric material therebetween where the dielectric material comprises a composite of two immediately juxtaposed and contacting layers of an identical capacitor dielectric composition. The composition is a strontium titanate, a strontium bismuth titanate, a lead lanthanate zirconia titanate, Ta₂O₅, or a mixture thereof. Claim 38 additionally recites that the discrete layers are crystalline and comprise an interface characterized by a perceptible change in crystallinity from one layer to the other, characterized by a perceptible lateral

shift in grain boundaries from one layer to the other. The amendment to claim 38 is supported by the specification at, for example, page 5, lines 20-24. Matsuda discloses a capacitor construction having a first dielectric layer 5 made of $\text{SrBi}_2\text{Ta}_2\text{O}_9$ and a second dielectric layer 6 on the first dielectric layer (col. 2, ll. 58-67). Matsuda further discloses a particular embodiment having a first and second dielectric layers each comprising $\text{SrBi}_2\text{Ta}_2\text{O}_9$ (col. 3, ll. 46-55). Matsuda does not disclose the claim 38 recited two juxtaposed and contacting layers of the identical capacitor dielectric composition selected from strontium titanate, strontium bismuth titanate, lead lanthanate zirconia titanate, Ta_2O_5 , and mixtures thereof.

With respect to Roh, the Examiner indicates that Roh discloses a capacitor containing a first electrode 4 and a second electrode 8 having two immediately juxtaposed and contacting barium strontium titanate dielectric layers 6 and 7. As amended, independent claim 38 no longer recites barium strontium titanate. Accordingly, Roh does not contribute toward suggesting the claim 38 recited group of materials. As combined with Matsuda, the BST layers 6 and 7 as disclosed by Roh does not contribute toward suggesting the claim 38 recited immediately juxtaposed and contacting layers of an identical dielectric composition selected from the recited group. Accordingly, independent claim 38 is allowable over Matsuda as combined with Roh.

Dependent claims 42, 46, 47 and 52 are amended to properly depend from corresponding base claim 38. Claims 42, 46, 47, 51 and 52 are allowable over the combination of Matsuda and Roh for at least the reason that they depend from allowable base claim 38.

Claims 43 and 48 stand rejected under 35 U.S.C. § 103(a) as being unpatentable

over Matsuda and Roh in further view of Fujii, U.S. Patent No. 5,661,319. As indicated by the Examiner at page 4 of the present Action, Fujii is relied upon as showing a capacitor with two dielectric layers formed of Ta₂O₅. However, Fujii distinctly discloses a first layer 101 and a second layer 102 where the second layer contains an amount of metal element in excess of the amount of that comprised by the first layer 101 (col. 3, ll. 17-25; col. 3, ll. 40-52 and claims 1, 5, 9 and 10). Fujii additionally discloses that dielectric films 101 and 102 can differ in elements contained in each layer as well as the amounts of specific elements (col. 3, ll. 54-58). Fujii does not disclose or suggest the claim 38 recited immediately juxtaposed and contacting layers of identical dielectric composition. Accordingly, as combined with Matsuda and Roh, Fujii does not contribute toward suggesting the claim 38 recited contacting yet discrete juxtaposed layer comprising identical capacitor dielectric compositions selected from the recited group. Accordingly, independent claim 38 is not rendered obvious by the cited combination of Matsuda, Roh and Fujii and is allowable over these references.

Claims 43 and 48 are amended to properly depend from claim 38. Claims 43 and 48 are allowable over Matsuda and Roh as combined with Fujii for at least the reason that they depend from allowable base claim 38.

Claims 49-50 and 53 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Matsuda and Roh as combined with Park, U.S. Patent No. 5,780,115. As indicated at page 4 of the present Action, Park is relied upon as disclosing a capacitor having titanium nitride electrodes. However, the titanium nitride electrodes as disclosed by Park, when combined with Matsuda and Roh, fail to disclose or suggest the claim 38 recited immediately juxtaposed and contacting yet discrete layers of identical capacitor

dielectric compositions selected from the recited group of compositions. Accordingly, independent claim 38 is not rendered obvious by Matsuda, Roh and Park and is allowable over these references. Claim 50 is amended to properly depend from independent claim 38. Dependent claims 49, 50 and 53 are allowable over the cited combination of Matsuda, Roh and Park for at least the reason that they depend from allowable base claim 38.

New claims 56-59 do not comprise "new matter" since they are fully supported by the specification as originally filed. Claims 56-59 are supported by previously pending claim 38 and the claims that depend therefrom, and the specification at, for example, page 4, line 23 through page 5, line 3; page 5, line 20 through page 6, line 7; page 7, line 21 through page 8, line 17; and Fig. 5.

New claim 56 recites a capacitor comprising a first capacitor electrode and a capacitor dielectric layer over the first capacitor electrode where the dielectric layer has a lower portion and an upper portion, the upper and lower portions each comprising identical barium strontium titanate compositions. Claim 56 further recites that the lower and upper portions are immediately juxtaposed, the upper portion having a perceptible change in crystallinity relative to the lower portion characterized by a perceptible interface line between the two discrete portions, and a perceptible lateral shift in grain boundaries across the interface. Applicant has set forth in previous responses arguments with respect to Roh indicating that Roh clearly teaches away from utilization of BST layers having the same composition. The Examiner indicates at page 5 of the present Action that Roh does not teach away from using two BST dielectric layers and alleges that Roh simply teaches away from "the use of how it was formed". The Examiner indicates that since the present claims are product claims and the teaching away is from methods, the obviousness rejection is

maintained. Applicant requests reconsideration of this position.

Roh clearly indicates that forming first and second BST dielectric films utilizing metal-organic chemical vapor deposition and rapid thermal annealing is problematic. However, Roh further indicates that the problem is due to the resulting dielectric film (product) which is contaminated and has degraded electrical characteristics (col. 1, ll. 60 through col. 2, ll. 2). Roh does not teach or suggest any method of overcoming the problems while maintaining utilization of two BST layers "of a predetermined composition" and instead specifically indicates utilization of differing compositions to overcome the problem that would otherwise occur in the product. Accordingly, Roh specifically teaches away from the claim 56 recited utilization of identical BST compositions in juxtaposed dielectric layers. Further, Roh does not teach or suggest juxtaposed layers of BST of identical composition where an upper layer or upper portion has a perceptible change in crystallinity relative to the lower portion characterized by a perceptible interface line between the two discrete portions and a perceptible lateral shift in grain boundaries across the interface.

None of the additional art references of record, when combined with Roh, contribute toward suggesting the claim 56 recited dielectric layer having an upper portion and a lower portion immediately juxtaposed where the upper portion and the lower portion comprise identical barium strontium titanate compositions and have a perceptible change in crystallinity characterized by a perceptible interface line between the two discrete portions and a perceptible lateral shift in grain boundaries across the interface. Accordingly, independent claim 56 is allowable over the art of record.

New claims 57-59 are allowable over the art of record for at least the reason that

they depend from allowable base claim 56.

For the reasons discussed above, pending claims 38, 42-43, 46-53 and 56-59 are allowable. Accordingly, applicant respectfully requests formal allowance of such pending claims in the Examiner's next action.

Respectfully submitted,

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